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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,251	11/26/2001	Martin Andrew Schlosser	35015/001	8627

28286 7590 10/24/2002

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EXAMINER
THOMPSON, JEWEL VERGIE

ART UNIT	PAPER NUMBER
2855	

DATE MAILED: 10/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/994,251	SCHLOSSER ET AL.
	Examiner	Art Unit
	Jewel V Thompson	2855

P-S

-- The MAILING DATE of this communication appears on the cover sh et with th correspond nce addr ss --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-44 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-44 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. Acknowledgement is made of the Information Disclosure Statement filed January 9, 2002, which has been made of record and placed in the file.

Claim Objections

2. Claims 16 and 17 are objected to because of the following informalities: In claims, 16 and 17 respectively, the applicant teaches, "said nodes" and "said meter electronics, however applicant has not previously claimed this term.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 10-15, 19-21, 23, 24, 26, 32, 36, 39-42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,157,975) in view of van der Pol (6,336,370)

Tanaka et al teaches the aspects of the claimed invention including a Coriolis flowmeter for measuring a process material flow having an ultra high level of purity, the Coriolis flowmeter comprising: (**clms. 1, 26**) a base (30); a flow tube means (10); end portions of the flow tube means are coupled (20) to the base (fig. 1A); a driver (71) coupled to the flow tubes means (fig. 1B); pickoff means (72 and 73) coupled signalwise to the flow tube means (col. 5, lines 37-40); meter electronics (col. 5 lines 41-47); a first and second set screw (20) (**clm. 2**) the driver vibrates the flow tube means (col. 5, lines 37-41); (**clms. 10 and 32**) the base is a solid rectangular element defining a parallelepiped (fig. 1A); (**clms. 11, 24**) the inlet (20) of the flow tube means receives the process material flow from a supply tube (col. 5, lines 25-27); the return tube ((10), between 70 and 60 in fig. 1A) is coupled to the base (20) and is positioned parallel to the flow tube means (between (72) and (20)) and (fig. 1A) and extends through the wall of the base (fig. 1A at (20)), an exit tube is connected to an outlet end of the return tube to extend the process material flow towards a user application (col.5, lines 20-21); (**clms. 15 and 36**) the driver (71) is affixed to the top of the single flow tube when in use (fig. 1A); (**clm. 19**) the flow tube extends through coaxial holes in the walls with ends of the single tube extending beyond the side walls (fig. 1A); (**clm. 20**) a first and second flow tube coupled to the base and positioned parallel to each other, the first and second flow tubes are adapted to be vibrated in phase opposition by the driver (col. 7. lines 56-

60); ((72 and 73) and (fig. 1B)); (**clm. 23**) the first and second flow tubes are connected in parallel (fig. 1B); (**clm. 44**) the Coriolis flowmeter is adapted to extend a flow of corrosive material including nitric acid **except** (**clm. 1, 26**) the flow tube means is formed of a material that does not transfer ions from the flow tube means to the process material; (**clms. 3, 39, 40**) the entirety of the wetted flow path comprises a PFA substance; (**clm. 4**) the flow tube means is formed of a PFA substance to maintain the process material free from contamination due to ion transfer from the flow tube means to the process means; (**clm. 12**) the flow tube means comprises a signal flow tube and that the base has a mass substantially greater than the mass of the flow tube with process material; (**clms. 13, 41**) the mass of the base is at least 1000 times the mass of the single flow tube with process material; (**clm.14**) the mass of the base is at least 100 times the mass of the single flow tube with process material (**clm. 21**) the driver being affixed to both the first and second flow tube and adapted to vibrate the first and second flow tube in phase opposition; (**clm. 26**) conductors extending from the pickoffs to the meter electronics; (**clms. 42**) the driver vibrates the flow tube at a resonant frequency and non resonant frequency of the material filled flow tube

Re: claims 1, 3, 4, 39 and 40

Van der Pol teaches a Coriolis mass flow meter comprising a conduit made of PFA. It is well known that PFA is a type of plastic, which because of its thickness does not allow the transfer of ions to pass through the material, which allows the material to be contamination free. It would have been obvious to one skilled in the art at the time

that the invention was made to have used the material, PFA, of van der Pol over the entire tube of Tanaka et al. for the purpose of creating a thick walled body.

Re: claims 12-14 and 41

Although Tanaka et al do not teach explicitly that the mass of the base is greater than the mass of the flow tube, Tanaka et al do teach that the flow tube is made of a quartz glass or similar suitable material (col. 5, lines 24-25); and that the fixing plate (base (30)) is mounted in such a way that the external vibrations are absorbed so that the tube is not influenced by the external vibrations (col. 9, lines 44-46). Since the use of some materials with a specific mass would have been obvious to one of ordinary skill in the art as a matter of arbitrary selection of a mass material, it would have been obvious to one of ordinary skill at the time that the invention was made to have selected a material with a mass of 1000 or 100 times the mass of the flow tube for the purpose of stabilizing the vibration of the flow tube.

Re: claim 21

Although Tanaka et al do not explicitly teach that a driver is affixed to both the first and second flow tube; it is taught in col. 5, lines 37-39 that the driver (71) drives the pair of flow conduits. It would have been obvious to one skilled in the art at the time that the invention was made to have used the driver of Tanaka et al which drives both of the flow conduits for the purpose of oscillating the fluid flowing through the tubes.

Re: claim 26

Although Tanaka et al do not explicitly teach that there are conductors extending from the pickoff, it is taught that the detectors output signals to a separate processing unit not shown (col.5, lines 45-47). It would have been obvious to one skilled in the art at the time that the invention was made to have known that in order provide information to the processor, there would have to be a means to carry that information for the purpose of determining the flow of fluid in the conduit and conductors certainly could be one of the means.

Also, Tanaka et al does not explicitly teach that the base (30) is massive in size, however it would have been an obvious matter of design choice to have the base to be massive in size I n order to stabilize any amount a vibration in the conduit, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955)

Re: claims 42

Although Tanaka et al do not explicitly teach that the driver vibrates the flow tube at a resonant frequency of the tube, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the driver vibrating at a resonant frequency since it is known in the art that the Coriolis induced response is inversely proportional to the resonant frequency of the structure for the purpose of measuring the flow of the fluid by measuring its vibration signals.

Claim Rejections - 35 USC § 103

4. Claims 5 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,157,975) in view of van der Pol (6,336,370) as applied to claims 1 and 26 above, and further in view of Lew (4,813,289)

Tanaka et al in view of van der Pol teach the aspects of the claimed invention **except** that the pickoff means is an electro-magnetic device having a magnet connected to the flow tube means and a coil

Lew teaches a Coriolis mass flow meter comprising a means for imposing flexural vibrations including an electromagnet and a ferromagnet; and the magnet detectors comprises a pick-up coil. It would have been obvious to one skilled in the art at the time that the invention was made to have used the electromagnet and coil of Lew in the Coriolis flow meter of Tanaka et al for the purpose of detecting motion.

Claim Rejections - 35 USC § 103

5. Claims 6 and 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,157,975) in view of van der Pol (6,336,370) as applied to claims 1 and 26 above, and further in view of Kalotay (5,400,653)

Tanaka et al in view of van der Pol teach the aspects of the claimed invention **except** the pickoff means comprises a light source and an optical detector; the vibrating flow tube means is positioned between the light source and the optical detector to alter the characteristics of the light received by the optical detector from the light source, the optical detector is responsive to the alteration to generate the signals representing the Coriolis deflections.

Kalotay teaches a Coriolis flow meter using optical sensors. The optical sensor (16) comprises a light source ((203) and (fig. 2)) and optical detectors (170L and 170R). The vibrating means (180) is positioned between the light source (203) and the optical detector (170L). It would have been obvious to one skilled in the art at the time that the invention was made to have used the optical detector and light source of Kalotay in the flow meter of Tanaka et al for the purpose of measuring the flow of fluid passing through the conduit wherein the phase of the displacement of the flow tube is measured using optical fiber sensors, since the light source received by the optical signal detector is converted to an electrical signal which is processed to generate the mass flow rate.

Claim Rejections - 35 USC § 103

6. Claims 7-9, 18, 25, 30, 31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,157,975) in view of van der Pol (6,336,370) as applied to claims 1, 20, 26 and 30 above, and further in view of Lister et al (6,286,373)

Tanaka et al in view of van der Pol teach the aspects of the claimed invention **except** that the base has a lower surface and an inner pair of upwardly extending side walls and also has an outer pair of upwardly ending walls; openings in each of the upwardly extending wall coaxially aligned to receive the flow tube means; the base is u-shaped; the ends of the flow tube extend beyond the side walls

Lister et al teach a Coriolis flowmeter having a section (302) which has a lower surface (in between 390 and 391) and an inner pair of upwardly extending side walls (390) and also has an outer pair of upwardly ending walls (391); openings in each of the upwardly extending walls coaxially aligned to receive the flow tube (fig. 3) and u-shaped (fig. 3); the ends of the flow tube extend beyond the side wall (see fig. 3 beyond the lower dotted line). It would have been obvious to one skilled in the art at the time that the invention was made to have place the base of Lester et al in the flow meter of Tanaka et al for the purpose of providing a housing which can withstand explosion of volatile material inside the housing.

Claim Rejections - 35 USC § 103

7. Claims 16, 17, 34, 35, 37, 38 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,157,975) in view of van der Pol (6,336,370) as applied to claims 12 and 26 above, and further in view of Van Cleve (6,363,794)

Tanaka et al in view of van der Pol teach the aspects of the claimed invention **except** a dynamic balancer means is coupled to the base proximate the nodes to maintain the nodes at a reduced level of vibration; the dynamic balancer means is an active dynamic balancer controlled by the exchange of signals with the meter electronics

Van Cleve teaches a Coriolis flowmeter comprising a balance bar which functions as a dynamic balancer (col. 14, lines 43-46) and meter electronics (921), which control the exchange of signals. The resonator balance bar is coupled to the balance bar (base) (col. 14, lines 64-66). The resonator bar would allow the driver to vibrate at a non-resonant frequency allowing the vibration to balance out. It would have been obvious to one skilled in the art at the time that the invention was made to have used the balance bar and meter electronics of Van Cleve in the flow meter of Tanaka for the purpose of canceling or minimizing any rotation of the balance bar due to the Coriolis signals applied by the flow tube by brace bar to balance bar resonator and using the meter electronics to determine the flow of materials using the signals.

Claim Rejections - 35 USC § 103

8. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,157,975) in view of van der Pol (6,336,370) as applied to claim 20 above, and further in view of Lew (5,078,014)

Tanaka et al in view of van der Pol teach the aspects of the claimed invention **except** that the first and second flow tubes are connected in parallel

Lew teaches a flow meter based of the Coriolis affect comprising two generally straight section (7 and 8) of the conduit, which are in series to one another (fig. 1). It would have been obvious to one skilled in the art at the time that the invention was made to have used the conduits connected in series of Lew in the flow meter of Tanaka et al for the purpose for measuring the vibrations relative to the two conduits connected in series.

Claim Rejections - 35 USC § 103

9. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,157,975) in view of van der Pol (6,336,370) as applied to claims 1 and 26 above, and further in view of Lanham et al (6,450,042)

Tanaka et al in view of van der Pol teach the aspects of the claimed invention **except** the single flow tube and the return tube are glued to the base

Lanaham et al teach a Coriolis flowmeter having tubes that may be molded separately and adhesive bonded to the sockets of the manifolds. It would have been obvious to one skilled in the art at the time that the invention was made to have used the same procedure as that of Lanham et al of gluing the tubes to the manifold in the flowmeter of Tanaka et al for the purpose of securing without any hardware.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jewel V Thompson whose telephone number is 703-308-6726. The examiner can normally be reached on 7-4:30, off alternate Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ben Fuller can be reached on 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3432 for regular communications and 703-305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1134.

Jewel V. Thompson

jvt
October 20, 2002

Benjamin R. Fuller
Supervisory Patent Examiner
Technology Center 2800